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Flexible collaboration transparency: supporting worker independence in replicated application-sharing systems

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 Authors **James Begole** Virginia Polytechnic Institute and State Univ., Blacksburg

Mary Beth Rosson Virginia Polytechnic Institute and State Univ., Blacksburg

Clifford A. Shaffer Virginia Polytechnic Institute and State Univ., Blacksburg

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↑ ABSTRACT

This article presents a critique of conventional collaboration transparency systems, also called "application-sharing" systems, which provide the real-time shared use of legacy single-user applications. We find that conventional collaboration transparency systems are inefficient in their use of network resources and lack support for key groupware principles: concurrent work, relaxed WYSIWIS, and group awareness. Next, we present an alternative approach to implementing collaboration transparency that provides many features previously seen only in collaboration-aware applications. Our approach is based on a replicated architecture where selected single-user interface components are dynamically replaced by multiuser versions. The replacement occurs at run-time and is transparent to the single-user application and its developers. As an instance of this approach, we describe its incorporation into a Java-based collaboration transparency system for serializable, Swing-based Java applications, called Flexible JAMM (Java Applets Made Multiuser). To validate that the flexible collaboration transparency system is truly an improvement over conventional systems, we conducted an empirical study of collaborators performing both tightly and loosely coupled tasks using Flexible JAMM versus a representative conventional collaboration transparency system, Microsoft NetMeeting. Completion times were significantly faster in the loosely coupled task using Flexible JAMM and were not adversely affected in the tightly coupled task. Accuracy was equivalent for both systems. Participants greatly preferred Flexible JAMM.

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↑ INDEX TERMS

Primary Classification:

C. Computer Systems Organization

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↳ C.2.4 Distributed Systems

↳ **Subjects:** Distributed applications

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↳ **D.2.2 Design Tools and Techniques**

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↳ **H.5 INFORMATION INTERFACES AND PRESENTATION (I.7)**

↳ **H.5.3 Group and Organization Interfaces**

↳ **Subjects:** Collaborative computing

General Terms:

Design, Human Factors

Keywords:

Flexible JAMM, Java, application sharing, collaboration transparency, computer-supported cooperative work, groupware, usability

↑ REVIEW

"Michael Lee Gordon"

In this context, collaboration refers to several people using an application to edit a shared object (such as a whiteboard, text, or graphics document). Comparisons are made between collaboration-aware applications (those that were designed and implemented to provide multi-user sharing) and transparent collaboration techniques, in which a single-user application is provided with a runtime environment that permits multi-user collaboration. The authors review schemes for providing transparent collaboration, identifying the drawbacks and limitations of such solutions. Flexible collaboration transparency is an approach that allows collaborators to transition among varying patterns of collaboration. The authors describe a prototype implementation called Flexible JAMM (Java applets made multi-user), which is freely available at <http://simon.cs.vt.edu/jamm/>. This paper is a good background for readers interested in transparent collaboration techniques. [Online Computing Reviews Service](#)

↑ Collaborative Colleagues:

James Begole: Janak Bhalodia
Rosco Hill
Francis Li
Mary Beth Rosson
Clifford A. Shaffer
Randall B. Smith
Craig A. Struble
John C. Tang

	Max Van Kleek Nicole Yankelovich			
Mary Beth Rosson:	Marc Abrams Sherman R. Alpert James D. Arthur John Artim Ronald Baecker James Begole James "Bo" Begole Rachel K. E. Bellamy Grady Booch Frank Buschmann Keith Butler John M. Carrol John Carroll John M. Carroll Shyam Chidamber George Chin George Chin Andrew M. Cohill Lenese Colson Jim Coplien Tim Dudley Dan Dunlap Marc Eisenstadt	Umer Farooq James Fogarty Donald J. Foss Steven Fraser Craig Ganoe Craig H. Ganoe Robert Glass Ephraim P. Glinert Al Goerner Eric Gold Hope D. Harley Austin Henderson Philip Isenhour Philip L. Isenhour Ivar Jacobson John Karat Irvin R. Katz Andrea Kavanaugh Wendy Kellogg Wendy A. Kellogg Norm Kerth Jonathan K. Kies Kibum Kim	Jürgen Koenemann Jürgen Koenemann-Belliveau Jürgen Koenenmann-Belliveau Stuart Laughton Doug Lea Tracy Lewis Tracy L. Lewis Wesley James Lloyd Susanne Maaß Susanne Maass Robert Mack Robert L. Mack Linn Marks D. Scott McCrickard Paul McInerney David Messner Brad A. Myers Dennis C. Neale Jakob Nielsen Manuel Pérez-Quñones Debbie Denise Reese Dave Roberts Scott P. Robertson	Con M. Rodi Wendy Schafer Jean Scholtz John R. Schorger Cheryl Seals Cheryl D. Seals Honna Segel Clifford A. Shaffer Mark K. Singley Penny L. Smith Jacob P. Somervell Mike Stark Christine Sweeney Jean-Claude Tarby Mary Van Deusen Mary S. Van Deusen Christina Van Metre Iris Vessey Robert C. Williges Stephanie Wilson Mark van Harmelen
Clifford A. Shaffer:	Marc Abrams C. Anderson K. Bae Kyung Bae Chuck A. Baker James Begole James "Bo" Begole James M.A. Begole James Michael Allen Begole Dave B. Boldery Patrick R. Brown John M. Carroll Laurence W. Carstensen Charles D. Feustel	Edward A. Fox Amit Goel Bernard Grossman Raphael T. Haftka J. He Jian He Lenwood S. Heath Gregory M. Herb David T. Hines J. Jiang Jing Jiang Yang Jun Ramana Juvvadi Colin A. Klipsch	Duane L. Knill Jürgen Koenemann Sheryl A. Kriss Mark Lattanzi Mark R. Lattanzi William H. Mason D. Scott McCrickard Vincent F. Miranda Robert W. Morrill Chris North Sriram V. Pemmaraju Naren Ramakrishnan Theodore S. Rappaport Mary Beth Rosson	Timothy L. Ryan Hanan Samet Purvi Saraiya Randall B. Smith Quentin F. Stout Craig A. Struble William H. Tranter Marc Vass A. Verstak Alex Verstak Layne T. Watson Robert E. Webber Jun Yang

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DistView: support for building efficient collaborative applications using replicated objects

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↑ ABSTRACT

The ability to share synchronized views of interactions with an application is critical to supporting synchronous collaboration. This paper suggests a simple synchronous collaboration paradigm in which the sharing of the views of user/application interactions occurs at the window level within a multi-user, multi-window application. The paradigm is incorporated in a toolkit, DistView, that allows some of the application windows to be shared at a fine-level of granularity, while still allowing other application windows to be private. The toolkit is intended for supporting synchronous collaboration over wide-area networks. To keep bandwidth requirements and interactive response time low in such networks, DistView uses an object-level replication scheme, in which the application and interface objects that need to be shared among users are replicated. We discuss the design of DistView and present our preliminary experience with a prototype version of the system.

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↑ INDEX TERMS

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↳ **D.1 PROGRAMMING TECHNIQUES**

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↑ **Collaborative Colleagues:**

<u>Atul Prakash:</u>	<u>Ratib Al-Zoubi</u>	<u>Trent Ray</u>	<u>Amit Mathur</u>	<u>Rajalakshmi</u>
	<u>Daniel E. Atkins</u>	<u>Jaeger</u>	<u>Amit Girish Mathur</u>	<u>Subramanian</u>
	<u>Guruduth Banavar</u>	<u>Farnam</u>	<u>Patrick McDaniel</u>	<u>Sushila Subramanian</u>
	<u>Erich Buss</u>	<u>Jahanian</u>	<u>Patrick Drew</u>	<u>W. T. Tsai</u>
	<u>Yih Chen</u>	<u>Fernam</u>	<u>Mcdaniel</u>	<u>Wei-Tek Tsai</u>
	<u>Robert Clauer</u>	<u>Jahanian</u>	<u>Kevan Miller</u>	<u>Yutaka Usuda</u>
	<u>Thomas A. Finholt</u>	<u>Timothy L.</u>	<u>Brian D. Noble</u>	<u>Michael Ward</u>
	<u>Vijay Garg</u>	<u>Killeen</u>	<u>Gary M. Olson</u>	<u>Terry Weymouth</u>
	<u>Robert W. Hall</u>	<u>Michael J.</u>	<u>Santanu Paul</u>	<u>Terry E. Weymouth</u>
	<u>Joseph Hardin</u>	<u>Knister</u>	<u>C. V. Ramamoorthy</u>	<u>Gwobaw Wu</u>
	<u>John Henshaw</u>	<u>Peter Knoop</u>	<u>Craig Rassmussen</u>	<u>Xin Zhao</u>
	<u>Nayeem Islam</u>	<u>Jang Ho Lee</u>	<u>John Riedl</u>	
	<u>Trent Jaeger</u>	<u>Li Li</u>	<u>Hyong Sop Shim</u>	
		<u>Jochen Liedtke</u>	<u>Robert Strom</u>	
		<u>Radu Litiu</u>		
		<u>Radu Cristian</u>		
		<u>Litiu</u>		
		<u>G. Robert Malan</u>		
		<u>Nelson R.</u>		
		<u>Manohar</u>		
<u>Hyong Sop Shim:</u>	<u>Joseph Hardin</u>			
	<u>Farnam Jahanian</u>			
	<u>Fernam Jahanian</u>			
	<u>Peter Knoop</u>			
	<u>Jang Ho Lee</u>			
	<u>G. Robert Malan</u>			
	<u>Atul Prakash</u>			
	<u>Sushila</u>			
	<u>Subramanian</u>			
	<u>Terry Weymouth</u>			
	<u>Terry E.</u>			
	<u>Weymouth</u>			

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